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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/736,583	12/17/2003	Lothar Hay	003810-030	5714
21839	7590	08/04/2005	EXAMINER	
BUCHANAN INGERSOLL PC (INCLUDING BURNS, DOANE, SWECKER & MATHIS) POST OFFICE BOX 1404 ALEXANDRIA, VA 22313-1404			PANG, ROGER L	
			ART UNIT	PAPER NUMBER
			3681	

DATE MAILED: 08/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/736,583

Applicant(s)

HAY, LOTHAR

Examiner

Roger L. Pang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 July 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 21-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 21,22,24-28,30-34 and 36 is/are rejected.
- 7) ☒ Claim(s) 23,29 and 35 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 10-20-04
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

The following action is in response to the amendment filed for application 10/736,583 on July 8, 2005.

Election/Restrictions

Applicant's election without traverse of Transmission I in the reply filed on July 8, 2005 is acknowledged.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 21-22, 24-25, 28 and 31-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohkubo in view of Tomio '055, in further view of Ichiki. With regard to claims 21 and 31, Ohkubo teaches a differential cage for a differential gear 40, comprising: a cage member having a cavity machined on an inside surface (Fig. 2), supporting compensating gear and driving gears (Fig. 2), and an axle drive gear 340 and a parking lock gear 341 which are integrally formed (Col. 14). Ohkubo lacks the teaching of the axle drive gear and parking lock gear being integrally formed with the cage member. Tomio teaches a differential cage member 2 with a cavity machined on an inside, wherein an axle drive gear 6 is formed in a one-piece forging together with the cage member (Abstract). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Ohkubo to employ a one-piece axle drive gear/parking lock gear/ cage member forging in view of Tomio in order to provide a more

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lightweight and compact differential. Ohkubo also lacks the teaching of an installation opening. Ichiki teaches a differential, wherein the cage member 11 comprises an installation opening (left side, Fig. 1). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Ohkubo to employ an installation opening in further view of Ichiki in order to allow easier access during maintenance and repair. With regard to claims 22 and 32, Ichiki teaches the cage wherein said cage member has two bores to support respective axle driving shafts 30. With regard to claim 24, Tomio teaches the cage, including aligned bores having a common axis to accommodate a bearing pin 7 for the compensating gears 10, a spacing of the common axis from the axle drive gear being chosen dependent on a desired size of the installation opening (of Ichiki). With regard to claims 25, 28, and 33, Ichiki teaches the cage wherein one of said two bores has a diameter which is great enough for a machining tool to be entered into said cavity, and a separate bearing sleeve 13 for the associated axle driving shaft being received in said bore with said great enough diameter (Fig. 1).

Claims 26-27, 30, 34 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohkubo, in view of Tomio, in further view of Ichiki as applied to claims 21 and 31, respectively, above, and further in view of Mucha. With regard to claims 26-27, 30, and 36, Ohkubo teaches the cage, but lacks the teaching of the teeth of said axle drive gear and parking lock gear being dual frequency induction hardened. Mucha teaches a gear 8 that is hardened via a dual frequency induction hardening process (Col. 8). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Ohkubo to employ dual frequency induction hardening for the axle drive gear and parking lock gear in further view of Mucha, in order to progressively harden the gears for longer durability. With regard to claim 34, Ohkubo

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teaches the cage, but lacks the teaching of the teeth of said axle drive gear and parking lock gear being dual frequency induction hardened. Mucha teaches a gear 8 that is hardened via a dual frequency induction hardening process (Col. 8), the respective teeth being subjected to a high frequency $>100\text{kHz}$ and a medium frequency $<20\text{kHz}$ simultaneously in a dual frequency induction process, a frequency mix of the high frequency and the medium frequency being adjusted so that layers near a surface are heated substantially equally from a root of the tooth to a tip of the tooth (Fig. 5). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Ohkubo to employ dual frequency induction hardening for the axle drive gear and parking lock gear in further view of Mucha, in order to progressively harden the gears for longer durability.

Allowable Subject Matter

Claims 23, 29, and 35 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Storm has been cited to show a similar dual frequency induction process.

Hasebe, Howe, Schmid, Baxter, and Nishiji have been cited to show similar axle driving gear arrangements.

FACSIMILE TRANSMISSION

Submission of your response by facsimile transmission is encouraged. The central facsimile number is (571) 273-8300. Recognizing the fact that reducing cycle time in the processing and examination of patent applications will effectively increase a patent's term, it is to your benefit to submit responses by facsimile transmission whenever permissible. Such submission will place the response directly in our examining group's hands and will eliminate Post Office processing and delivery time as well as the PTO's mail room processing and delivery time. For a complete list of correspondence not permitted by facsimile transmission, see MPEP 502.01. In general, most responses and/or amendments not requiring a fee, as well as those requiring a fee but charging such fee to a deposit account, can be submitted by facsimile transmission. Responses requiring a fee which applicant is paying by check should not be submitting by facsimile transmission separately from the check.

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Responses submitted by facsimile transmission should include a Certificate of Transmission (MPEP 512). The following is an example of the format the certification might take:

I hereby certify that this correspondence is being facsimile transmitted to the Patent and Trademark Office (Fax No. (571) 273-8300) on _____ (Date)

Typed or printed name of person signing this certificate:

(Signature)


If your response is submitted by facsimile transmission, you are hereby reminded that the original should be retained as evidence of authenticity (37 CFR 1.4 and MPEP 502.02). Please do not separately mail the original or another copy unless required by the Patent and Trademark Office. Submission of the original response or a follow-up copy of the response after your response has been transmitted by facsimile will only cause further unnecessary delays in the processing of your application; duplicate responses where fees are charged to a deposit account may result in those fees being charged twice.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Roger L. Pang whose telephone number is 571-272-7096. The examiner can normally be reached on 5:30am to 4:00pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Marmor can be reached on 571-272-7095. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Roger L Pang
Primary Examiner
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August 1, 2005